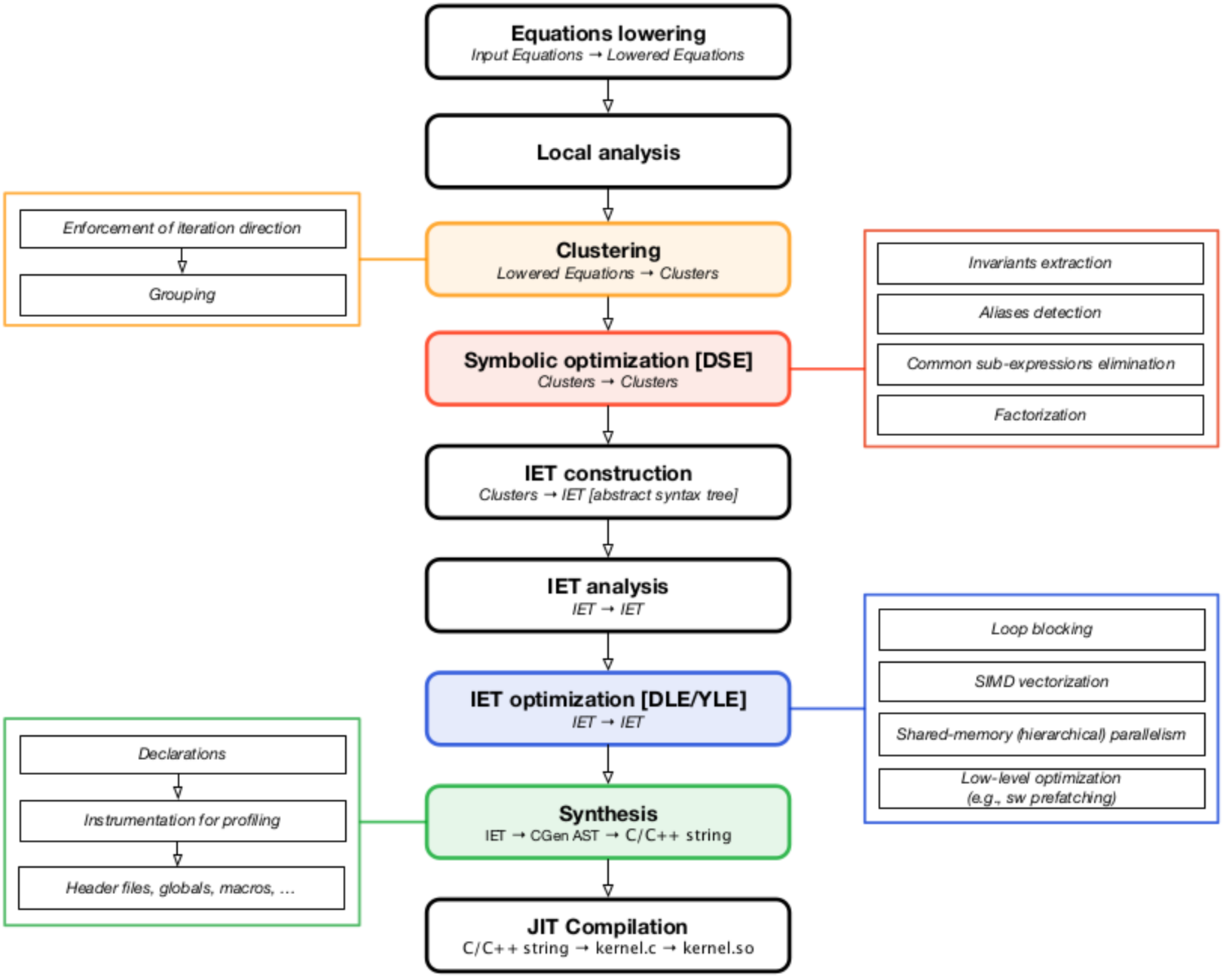
Equations lowering
Input Equations → Lowered Equations
Local analysis
Enforcement of iteration direction
Grouping
Clustering
Lowered Equations → Clusters
Invariants extraction
Aliases detection
Common sub-expressions elimination
Factorization
Symbolic optimization [DSE]
Clusters → Clusters
IET construction
Clusters → IET [abstract syntax tree]
IET analysis
IET → IET
Loop blocking
SIMD vectorization
Shared-memory (hierarchical) parallelism
Low-level optimization
(e.g., sw prefatching)
IET optimization [DLE/YLE]
IET → IET
Declarations
Instrumentation for profiling
Header files, globals, macros, …
Synthesis
IET → CGen AST → C/C++ string
JIT Compilation
C/C++ string → kernel.c → kernel.so